Ser. No. 09/929,397
Response and Amendment C dated April 21, 2004
Reply to Office Action dated December 30, 2003

This listing of claims will replace all prior versions, and listings, of claims in the application:

<u>Listing of Claims:</u>

1.   (canceled)

2.   (previously presented)   The method of Claim 21 wherein the first polygon, the second polygon and the polygonal intersection are represented by data indicating a list of links.

3.   (previously presented)   The method of Claim 2 wherein the links represent the boundaries of the polygons.

4.   (previously presented)   The method of Claim 2 wherein the links in the list of links are consistently ordered in either a clockwise or counterclockwise direction.

5.   (previously presented)   The method of Claim 2 wherein a hole located in the first polygon is represented by data indicating a list of links.

6.   (previously presented)   The method of Claim 5 wherein the links in the list of links that represent a hole are ordered in an opposite direction to the direction used to order the links in the list of links used to represent the first polygon.

7.   (previously presented)   The method of Claim 2 wherein the links in the list of links are consistently ordered in a clockwise direction.

8.   (previously presented)   The method of Claim 21 wherein the first polygon and the second polygon represent two-dimensional geographic features.

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9.   (previously presented)   The method of Claim 21 wherein the steps of determining are performed by a software program that uses a geographic database containing data representations of the first polygon and the second polygon.

10.   (previously presented)   The method of Claim 21 wherein the portion of the boundary of the first polygon that is located inside the second polygon is determined by determining on which side of the boundary of the second polygon the portion of the boundary of the first polygon is located.

11.   (previously presented)   The method of Claim 21 wherein the intersection of the boundary of the first polygon with the boundary of the second polygon is found by searching a rectangular area formed by an intersection of a first minimum bounding rectangle encompassing the first polygon and a second minimum bounding rectangle encompassing the second polygon.

12.   (previously presented)   The method of Claim 21 further comprising:
        determining an additional polygonal intersection of the first polygon and the second polygon by performing the determining steps for any additional intersection of the boundary of the first polygon with the boundary of the second polygon which is not already part of the polygonal intersection of a first polygon and a second polygon already determined.

13.   (previously presented)   The method of Claim 21 wherein the steps of determining are performed on a server connected to the Internet and that provides navigation-related services to users.

14.   (canceled)

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15.   (previously presented)   The invention of Claim 22 wherein said program is run on a server connected to the Internet that provides navigation-related services to users.

16.   (previously presented)   The invention of Claim 22 wherein said polygons represent two dimensional geographic features.

17.   (previously presented)   The invention of Claim 22 wherein said polygons are represented by data contained in a database that represents geographic features.

18.   (currently amended)   A method for determining a polygonal intersection of a first polygon and a second polygon represented by data contained in a geographic database,

wherein a boundary of the first polygon is represented by a first list of links connected at endpoints thereof and the second polygon is represented by a second list of links connected at endpoints thereof,

wherein an endpoint of a link is represented by either a node or a shape point;

wherein each location at which the boundary of the first polygon intersects with the boundary of the second polygon is represented by a node;

wherein the links contained in the first list of links are in an order corresponding to a consistent direction of traversal of the corresponding links representing the boundary of the first polygon;

wherein the links contained in the second list of links are in the order corresponding to the consistent direction of traversal of the corresponding links representing the boundary of the second polygon;

the method comprising the steps of:

determining a first minimum bounding rectangle that encompasses the first polygon;

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determining a second minimum bounding rectangle that encompasses the second polygon;

determining that the first minimum bounding rectangle and the second minimum bounding rectangle intersect;

identifying each link located entirely in a first polygonal area formed by an intersection of the first minimum bounding rectangle and the second minimum bounding rectangle that has at least one node at an endpoint of said link;

associating in a node-link map each node connected to each identified link with each link to which the node is connected;

identifying a node from the node-link map that has at least three links connected to it;

from the order of two of said at least three links that belong to one of the polygons, determining which one of said at least three links that belong to the other of polygons is located inside the one of said polygons;

using the link that is located inside the one of said polygons as a starting link for the polygonal intersection of the first polygon and the second polygon; and

determining each other link of the polygonal intersection by selecting ~~from the links that connect~~ a link that connects to a currently known link in a selected direction of traversal and where a leading end of a currently known portion of the polygonal intersection in the selected direction of traversal connects to two other links, selecting ~~according to the consistent direction of travel~~ that link that forms a minimum rotation angle in a selected rotational direction with the currently known link, wherein the selected rotational direction is opposite to the selected direction of traversal.

19. (original) The method of Claim 18 wherein the steps of determining, associating, identifying and using are performed by a software program that uses the geographic database.

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20.   (original)   The method of Claim 18 wherein the steps of determining, associating, identifying and using are performed on a server connected to the Internet and that provides navigation-related services to users.

21.   (previously presented)   A method for determining a polygonal intersection of a first polygon and a second polygon, wherein the first polygon has a boundary comprised of a series of links ordered in a known rotational direction and the second polygon has a boundary comprised of a series of links ordered in the known rotational direction, the method comprising:

at an intersection of the boundary of the first polygon with the boundary of the second polygon, determining a first known portion of a boundary of the polygonal intersection as comprised of a portion of the boundary of the first polygon that is located inside the second polygon, wherein the portion of the boundary of the first polygon that is located inside the second polygon is comprised of one or more links; and

where a leading end of the current known portion of the boundary of the polygonal intersection connects to two other links, determining a subsequent portion of the boundary of the polygonal intersection by selecting that portion of the boundary of either the first polygon or the second polygon that connects to the leading end of the current known portion of the boundary of the polygonal intersection and

that forms a minimum rotation angle in the rotational direction with the current known portion of the boundary of the polygonal intersection if the direction of traversal of the current known portion of the boundary of the polygonal intersection is opposite the known rotational direction or

that forms a minimum rotation angle in the opposite rotational direction with the current known portion of the boundary of the polygonal intersection if the direction of traversal of the current known portion of the boundary of the polygonal intersection is the same as the known rotational direction.

22.   (currently amended)   A program for determining a polygonal intersection of a first polygon and a second polygon, wherein the first polygon has a boundary

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comprised of a series of links ordered in a known rotational direction and the second polygon has a boundary comprised of a series of links ordered in the known rotational direction, the ~~method~~ program comprising:

program code that determines a first known portion of a boundary of the polygonal intersection as comprised of a portion of the boundary of the first polygon that is located inside the second polygon, wherein the portion of the boundary of the first polygon that is located inside the second polygon is comprised of one or more links at an intersection of the boundary of the first polygon with the boundary of the second polygon; and

program code that

determines a subsequent portion of the boundary of the polygonal intersection where a leading end of the current known portion of the boundary of the polygonal intersection connects to two other links by selecting that portion of the boundary of either the first polygon or the second polygon that connects to the leading end of the current known portion of the boundary of the polygonal intersection

that forms a minimum rotation angle in the rotational direction with the current known portion of the boundary of the polygonal intersection if the direction of traversal of the current known portion of the boundary of the polygonal intersection is opposite the known rotational direction or

that forms a minimum rotation angle in the opposite rotational direction with the current known portion of the boundary of the polygonal intersection if the direction of traversal of the current known portion of the boundary of the polygonal intersection is the same as the known rotational direction.